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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,238	07/02/2007	Kenji Kubomura	062907	7370
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WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036			EXAMINER	KATZ, VERA
			ART UNIT	PAPER NUMBER
			1794	
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			04/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,238	<b>Applicant(s)</b> KUBOMURA ET AL.
	<b>Examiner</b> Vera Katz	<b>Art Unit</b> 1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 06 February 2009.  
 2a) This action is FINAL.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-10 is/are pending in the application.  
 4a) Of the above claim(s) 9 and 10 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-8 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449)  
 Paper No(s)/Mail Date 09/25/2006

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Information Disclosure Statement***

1. The listing of references in the instant specification in paragraphs 0002-0005 is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

***Claim Objections***

2. Claims 2, 4, 6 and 8 are objected to because of the following informalities:  
Claims 2 and 4, line 3 and claims 6 and 8, line 2 recite "a said". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2, 4, 6, and 8 appear to be two separate sentences. The claims also appear to be narrative in form. The claims are generally narrative and indefinite, failing to conform to current U.S. practice.

4. Claims 2 and 4, line 4, and claims 6 and 8, line 3 recite the limitation "the surface". Claims 5 and 7 recite "the content" in line 2. Claims 6 and 8 recite "the production" in line 1. There is insufficient antecedent basis for these limitations in the claims.

Claims 1-4 recite "high aspect ratio" this limitation is broad and it is not clear what the range for the "high" is and when it is not high.

Claim 7 recites titanium oxide whisker, wherein "the content of non-iron metal atoms is less than 10 at. %". It is not clear what is the iron and titanium metal content in the titanium oxide whiskers? For compact prosecution this limitation will be examined as if the content of non-titanium metal atoms is less than 10 at. %.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 3-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Tatsuya (JP 200-203998, cited in IDS and ISR). Tatsuya teaches a base plate 10 that is made of titanium –based alloy; [0034]. The titanium alloy has a surface 13 and the titanium oxide whiskers 15 are formed. The formed titanium oxide whiskers, as taught by the reference,

have sufficient aspect ratio; [0059], which is considered to be a high aspect ratio. As well Tatsuya teaches that that an air or water vapors can be used as an oxygen source for oxidizing titanium surface at high temperatures; [0015-0016, 0025, claims 24-29]. However, the recitation "is brought into contact with oxidative atmosphere so as to react the surface titanium atoms with oxygen atoms brought into contact therewith at high temperature" of claims 4 and 8 is considered a process limitation that does not limit the structure of the whiskers.

6. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayashi (20020136928). Hayashi teaches hematite particles (iron oxide with the formula Fe<sub>2</sub>O<sub>3</sub>), that is formed on the surface of iron alloy; [0103, 0111, 0112, 0114]. Hayashi shows that the hematite particles are oriented in a major axis direction and are considered to be whiskers; [0020]. The recitation "is brought into contact with oxidative atmosphere so as to react the surface iron atoms with oxygen atoms brought into contact therewith at high temperature" of claims 2 and 6 is considered a process limitation that does not impart a structural limitation to the article as claimed. The reference further teaches, for example, the diameter of the iron oxide whiskers of 0.005-0.3  $\mu$ ; [0022]. This range is within the scope of the applicant's claimed range. The reference teaches an aspect ratio of 10:1 to 25.1; [0080]. This range is within the claimed range. As taught by the art, the whiskers are high-purity, and may contain sodium metal less than 200 ppm; [0070]. This range is within the claimed range for the non-iron metal atoms.

7. Claims 3-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Den (6649824). Den teaches a titanium layer 42 which is considered to be titanium alloy; [col. 10, line 15]. The Ti layer has a surface and titanium oxide whiskers are formed on that surface; Figs. 4A, C, 5A, C. The whisker can be formed by oxidizing the surface in the oxygen atmosphere by heating; [col. 10, line 38 and col. 18, line 17-18]. See also a paragraph above - related to discussion of product-by-process claims.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatsuya (JP 200-203998, cited in IDS and ISR). As disclosed by Tatsuya, the size of the whiskers that is regarded to be a diameter, is in the range of several nm to several micrometers which is substantially close to the claimed range. As taught by the reference, the length of the whiskers is within several 10 nm-hundreds of micrometers. Based on the teaching of the length and diameter range, the aspect ratio of the reference overlaps in scope the range of the instant claim. Alternatively, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, In re

Malagari, 182 USPQ 549. [0061, 0077]. As taught by the reference, the titanium plate, which is a source of titanium, is 99.99% of purity; [0097]. The contamination of other elements is not reported in this reference. It would have been obvious to one of ordinary skill in the art to manufacture titanium oxide whiskers with a content of non-titanium metal atoms less than 10 percent atomic volume, because the industrial areas, such as electronics, optoelectronics, photocatalysts, etc., where the whiskers are utilized require high purity materials; [0001].

9. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Den (6649824) in view of Tatsuya (JP 200-203998, cited in IDS and ISR). Den teaches an example 1 with a high aspect ratio of 10 and TiO<sub>2</sub> whisker diameter of 100 to 200 nm; [col. 12, line 60]. The diameter and aspect ratio ranges are completely within the claimed range. Den is silent about the content of non-titanium atoms. Nevertheless, the titanium plate as taught by Tatsuya, which is a source of titanium, is 99.99% of purity; [0097]. The contamination of other elements is not reported in this reference.. It would have been obvious to one of ordinary skill in the art to manufacture titanium oxide whiskers with a content of non-titanium metal atoms less than 10 percent atomic volume, because the industrial areas, such as electronics, optoelectronics, photocatalysts, etc., require high purity whisker materials; [Tatsuya, 0001 and Den, abstract].

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See attached form PTO-892.
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Katz whose telephone number is (571)270-7082. The examiner can normally be reached on M - Th 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JENNIFER McNEIL can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vera Katz/  
Examiner, Art Unit 1794

/JENNIFER MCNEIL/  
Supervisory Patent Examiner, Art Unit 1794